

MUNICIPAL JOURNAL AND ENGINEER

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COMPLETION OF CROTON DAM

**Largest in the World and Was Under Construction Fourteen Years—Will Improve Water Supply
—Cost, \$8,000,000**

THE completion of the \$8,000,000 Croton Dam marks the full development of the water supply that has given New York City water its name for many years. The first supplies of water for the city were from wells, and future supplies will be taken from various tributaries of the Hudson at distant points in the State.

The Croton dam has been under construction for fourteen years and is the largest of its kind in the world, being constructed on nearly one million cubic yards of masonry. It extends over 2,000 feet in length across the valley of the Croton river, and, though 300 feet high, holds back water to a maximum depth of only 160 feet, forming a lake 22 miles long. The volume of water in this lake—thirty thousand-million gallons—would supply the city with water for three or four months without replenishing.

The construction of this dam has been an object of interest to civil engineers and the public at large for years—from the selection of the present location, by Alphonse Fleley, to the pointing of the Ashlar masonry, recently accomplished. After excavating to rock it was found necessary to go 100 feet deeper, and even at that depth fissures were found that had to be filled with cement grout. The Croton river had to be diverted from its bed and carried through a channel blasted out of the rocks on the side of the valley. Stone quarries were opened to supply the material for masonry, and farms and valleys were bought, and even a cemetery, to make room for the new lake. Now that the work is finished, Croton will still be one of the show places about the metropolis—a public park in which there will be fifty miles of drives.

The effect of the completion of this work will be to improve the sanitary condition of New York City's water, besides conserving the supply, which is not entirely satisfactory. The occasional odor found in the water is chiefly due to microscopic organism from the Central Park reservoir, which, owing to pressing demands for water, has not been cleaned as often as desirable in recent years. It is thought that the effect of longer storage of the supply in the new Croton lake will tend materially to improve the sanitary condition of the water.

WILMINGTON AND WATER METERS

Delaware City's Experience Successful, According to Chief Engineer—Reduction in Rates and Saving in Pumpage

WATER meters have proved successful in Wilmington, Del., where they are installed by the city and their use is optional with householders. Chief Engineer Leisen states, in a recent report, that the opposition which prevailed elsewhere to metering private dwellings was also extant in Wilmington, but that results justify their installation.

Most of the householders, according to the report, who formerly paid from \$14 to \$18 per annum under schedule rates, now pay but \$10; others, formerly paying \$20 to \$30, now obtain equivalent service for \$15, while those who were charged from \$40 to \$50, now consume all they desire for \$20. "Our minimum charge for a 5/8-inch meter, the smallest now installed," states the report, "is \$40 per annum, and this gives an allowance of 300 gallons per day, a quantity which has proved fully adequate for the requirements of the average family.

"The total actual saving in pumpage was 500,000,000 gallons per annum, equivalent to 25 per cent. of the total pumpage, and this result was due, not to any curtailment of the use of water, but to the elimination of waste and the reduction of leakage. If the original condition had prevailed during the last year of period mentioned, and the same rate per capita had been maintained, there would have been 800,000,000 gallons pumped in excess of the quantity required for all purposes.

The cost for pumpage in Wilmington is approximately \$6 per million gallons, so that the gross annual saving would be \$4,800. The expenditure for the purchase and installation of meters for the period quoted averaged \$2,300 per annum, and assuming 10 per cent. for interest and depreciation, there would be \$230 to deduct from the amount saved on pumpage, leaving a net gain of \$4,570 per annum, which, capitalized at 4 per cent., shows \$114,250 to the credit of a metered water supply. And this result was obtained with only a comparatively small proportion of the supply metered.

To Philadelphians these figures will doubtless appear rather insignificant, but if they are multiplied by fifty the result will be an approximate indication of the saving which can be effected.

CITIES SHOULD CONTROL CASES

Dr. Arnold Klebs, of Chicago, Urges Municipal Supervision of Consumption—Origin of Disease—Modes of Treatment

MUNICIPALITIES must deal with consumption, according to the views of many physicians, voiced by Dr. Arnold Klebs, of Chicago, speaking at the close of the Tuberculosis Exhibition recently held at Indianapolis, Ind.

Lieutenant-Governor Miller introduced Dr. Klebs, who said he appreciated the fact that every city should refrain from enacting more ordinances than it could enforce; yet there was no question that tuberculosis should be one of the serious questions considered. He said that the disease spreads in a peculiar way, following the lines of greatest density of commerce.

"Tuberculosis," said Dr. Klebs, "is not found in the plateaus or on mountain tops, but in the seaports, the large cities, and the centers of population; and, therefore, the disease requires municipal control. Health inspectors should be provided, with power to enforce regulations relative to the registering of cases, and the adoption of sanitary disinfecting measures. Each city should have a consumption dispensary, and a staff of nurses to visit the homes of the poor and treat cases in early stages of the disease."

Dr. Klebs told of what is being done in other countries to stamp out the disease, of the forest schools of Germany, the sanatoria of France, and the open-air colonies of Italy and of other countries. "America," he said, "has been slow to awaken to the great extent of the disease, but this handicap will be overcome by the characteristic aggressiveness and thoroughness of the Americans."

Milwaukee's Good Showing

INTERESTING statistics directly concerning the vital interests of Milwaukee, Wis., were given in a recent address by Mayor David S. Rose. Eight years ago the assessed valuation of all city property was about \$146,000,000, while it now approximates \$187,000,000. Provisions of the city charter, limiting its borrowing capacity to 5 per cent. of the average assessed property valuation for the last five years, have been strictly observed, and Milwaukee's present outstanding indebtedness is more than \$1,110,000 below the charter limitation. The average annual city tax from 1890 to 1898 was \$17.71 a thousand, and from 1898 to 1905, \$16.96 or a decrease of 75 cents on a thousand dollars.

Westfield's Successful Gas Plant

THE successful operation and improvement of the municipal gas plant at Westfield, Mass., is shown by a recent report of Superintendent Pettibone. The net profits last year amounted to 20 per cent. on the investment, while during seven years previous the city has conducted the plant, the annual profits averaged 12 per cent.

The plant was purchased under the State law of 1893, which compels a municipality to purchase the works of any existing company when it enters the lighting field. The price paid was \$150,000. Since then the price of gas has been reduced from a minimum of \$1.85 to \$1.30 a thousand feet, one of the lowest rates in the State. While, under private control, the streets were lighted by twenty arc-lights, at \$85 per year each, and forty lights at \$75 each, the city now pays the lighting department \$105 a year for all lights, realizing a profit at this rate of from \$25 to \$35 per light.

During the past year power equipment has been added and current for commercial use is furnished on a basis of 5 cents per kilowatt hour, with a sliding scale of discounts.

Municipal Lighting at Troy, N. Y.

TROY, N. Y., has taken steps toward municipal ownership of its lighting plant. At the meeting of the Board of Contract and Supply, March 16, bids for city lighting, submitted by two companies, were rejected as excessive, and the Corporation Counsel was directed to draft a measure for presentation in the Legislature, authorizing the establishment and operation of a city plant. The Troy Gas Company offered to furnish a thousand candle-power arc light at 32 cents per light per night, the present price being 32¾ cents. Under the new rate the city would have to pay \$109.50 per year for each arc light, a reduction from present charges of \$10. In bidding for gas for public buildings, the company agreed to provide light at the rate of \$1.10 per thousand feet, while the present rate paid by the city is \$1.20. The rate for street lights was not changed, the company asking 7½ cents per light per night. The Troy Company bid on light for the district covered in the old city, while the proposal of the Beacon Electric Company is for that section of the city north of First street, North End. Mayor Mann said the bids were too high, as there was no reason that the cost of lighting for the city of Troy should be more than that paid in other cities. On his recommendation the bids were rejected.

Jamestown Exposition Plans and Contracts

PLANS are rapidly developing for the Jamestown, Va., Exposition, and it is expected that all buildings will be ready for occupancy six months before the opening, April 26, 1907. The Exposition Company recently awarded contracts for erecting the main exhibit buildings, and plans for other structures are being prepared as fast as possible. Each of the main buildings will be 600x250 feet, with approximately 60,000 feet of floor space, exclusive of galleries.

Water will be obtained from Norfolk, the city having agreed to construct a 16-inch main to the Exposition grounds at a cost of \$60,000. Twelve miles of roads and boulevards have already been completed, a great many of which are planted with double rows of shade trees. All the main boulevards have planting space in the center and shaded paths on either side.

TOWNS ASSISTED BY STATE

Connecticut Law Authorizes Comptroller to Advance
Money for Railroad Improvements—Cities Must
Raise Equal Amount

UNDER a law enacted in 1903, the State of Connecticut holds itself liable to aid in paying the indebtedness of towns having a total property valuation of \$2,000,000 and a bonded indebtedness caused by assisting in building any railroad. The statute provides that the Comptroller, when authorized by the State Board of Control, shall pay to the Selectmen one per cent. of the amount of the indebtedness, provided he shall first satisfy himself that the town has raised an equal amount by local taxation. The latter provision has saved the State nearly three-quarters of a million dollars, for, while some towns pay considerably more than one per cent., and one town, Bloomfield, has declined State aid, many towns have failed to meet their liabilities.

The following table shows the status of the towns coming within the provisions of the law:—

	Indebtedness, May 1, 1903.	Amt. payable each year.	Paid in 1904.	Paid in 1905.	Paid in 1906.
Washington	\$28,000	\$280	\$280	\$280	\$280
Essex	43,000	430	430	430	....
Chatham	102,000	1,020	1,020	1,020	1,020
No. Canaan	30,000	300	300	300	....
Portland	275,000	2,750	2,750	2,750	2,750
Middlefield	28,000	280	280	280	....
Rocky Hill	21,000	210	210	210	....
Old Saybrook....	15,000	150	150	150	150
Saybrook	25,000	250	250	250	....
Hebron	28,000	280	280	280	....
Salisbury	19,000	190	....	190	....
Roxbury	27,000	270	....	270	270
Total	\$641,000	6,410	\$5,950	\$6,410	....

Norfolk's New Charter

THE Norfolk, Va., charter bill has been passed by the Virginia Legislature and now awaits the signature of the Governor. The amendments in the new charter creating the most discussion were the provision for the election of the Board of Control by direct vote and the franchise clause. As the charter stands, a provision reserving to the city the right to take over a franchise at any time during its life has been eliminated. It was concluded that such a clause would have operated to keep capital away from the city and retard its development.

A Municipal Ownership Victory

By a plurality of but fifteen votes out of 18,000 cast, William Hickman Moore, the candidate of the Municipal Ownership party, was elected, on March 6th, Mayor of Seattle, Wash. The contest for the mayoralty, probably the closest ever held in any Pacific Coast city, pledges Seattle to municipal ownership of public service utilities.

The platform of the Municipal Ownership party calls for immediate acquisition, by purchase, of street railway

lines, telephone franchises, gas franchises and other utilities by the city. The successful candidate has been a judge of the Superior Court of Kings county and a member of the upper legislative house in the State of Washington. He has guaranteed to bring, at the earliest possible moment, the question of municipal ownership before the people at a special election.

It was decided at the election to float two bond issues, one of \$500,000, for the extension of the park system, and one of \$600,000 for extending the lighting system. Of eight charter amendments seven carried, the one killed increasing the salaries of city officials. Of the others the two most important respectively provided for a "common user" clause in all street railway franchises hereafter granted and for the recall of councilmen, derelict in their duty, by the majority vote of the people at a special election.

City Ownership of Mines

WHETHER or not minerals under city streets and alleys are the property of the municipality is a question which the Supreme Court of Colorado must decide. The case is that of the city of Leadville against the Coronado Mining Company and the St. Louis Smelting and Refining Company, and involves the right of the city to collect royalties from the mining companies on the theory that streets and alleys belong to the municipality. The companies secured a verdict in the lower court.

The Washington Filtration Plant

UNDER this caption, the front page of our issue of February 28 contained some data purporting to bear upon the results obtained from the operation of this plant. Owing to defective information, used for what was then published, it was made to appear that "deaths in two cities which obtain water from mountain streams" amounted to 4 per cent., a similar basis being adopted for a list of other cities under varying conditions of supply, the alleged "percentage" rising to as much as 80.3 in seven cities whose water supplies are polluted by the cities themselves. In response to a request addressed to Assistant Superintendent E. F. Longley, who was named as the authority for these figures, that gentleman has kindly furnished us with a corrected table, reproduced below, showing that the figures used by him referred to typhoid deaths only, and were also stated in the usual term, for that cause of mortality, of per 100,000 instead of per cent. No. of

No. of cities.	Source of Supply.	Typhoid deaths per 100,000
2	Pure mountain streams	4.0
10	Filtered supplies	8.3
7	Ground water, springs, etc.	14.7
7	Surface waters and large storage reservoirs, all protected	23.1
8	Normal rivers, pollution not apparent	28.5
7	Upland streams, small lakes	42.0
11	Polluted rivers, public and private wells	60.8
7	Great lakes, supplies polluted by the cities themselves	80.3

GOOD ROADS COMMITTEE MEETING

Important Matters to Be Discussed at Albany, N. Y.

—How to Spend \$50,000,000—Main Highways

—Proposed Legislation

ALBANY, N. Y., is to entertain the standing committee of the Good Roads Convention, April 3-4, and Supervisor Edward J. Bedell will represent the home city at the meeting. The committee recommends that legislation for the distribution of the \$50,000,000 bond issue be made in one Act; that the State maintain the roads built similar to the plan in operation in Massachusetts, and that the State designate the roads to be improved, so that the apportionment can be made equitably between the counties of the State. It also recommends that grade crossings be eliminated; that county conventions be held to discuss highway improvements; that prison labor be employed in crushing stone for use on the roads, and that a law be passed to acquire the property necessary for good roads by condemnation proceedings, without the expensive practice now in vogue.

Other recommendations are as follows:—

"The counties may petition for the improvement of such main highways as they deem necessary for the internal development of their county. The State Engineer may then approve and may build these roads if the roads petitioned for are:—

"First—A desirable part of a county system of development.

"Second—A desirable part of a State system.

"Third—If they constitute an equitable apportionment among the counties, as required by the constitutional amendment.

"We do not recommend any legislation which will apportion the \$50,000,000 to the counties in cash."

Fire Engineers to Meet

The Board of Directors of the International Association of the Fire Engineers met in Paterson, N. J., March 14, to make arrangements for the next convention of the Association at Dallas, Texas, October 9-12. The most important matter considered was the selection of subjects for discussion, and it was decided that ideas relative to fire-fighting in towns of moderate size should be the principal matter considered. In previous conventions the subject of fire-fighting in high buildings has received much attention—a subject of comparatively little interest in towns of less than 25,000 inhabitants. Insurance men and architects will be invited to take part in this discussion.

Streets of McKeesport, Pa.

McKEESPORT, PA., has 26½ miles of improved highways, according to the records of the City Engineer's office. Of these, 20.94 miles are brick-paved and 5.63 miles are paved with block stone. The average cost of

brick paving per square yard was \$1.45, and the total cost, \$722,469.87, being an average cost per mile of \$34,503. Stone paving cost an average of \$3 per square yard, the total cost being \$404,510, an average of \$71,912.94 per mile. The improvements have entailed a total expenditure of \$1,126,980, which includes inlets, retaining walls, culverts, etc. The street improvements estimated for the present year cover 1.5 miles, to cost \$45,000.

NEW SCHOOLS FOR MINNEAPOLIS

Supreme Court Decides Bond Issue Authorized by Legislature is Legal—\$100,000 for High School

THE Supreme Court of Minnesota has declared that the \$200,000 issue of school bonds authorized by the 1905 session of the Legislature, and advertised last summer is legal, and the Board of Education will shortly ask for bids for new buildings. For several years the school population has increased very rapidly, and since the bidders refused to take the bonds unless the issue was sanctioned by the highest tribunal of the Commonwealth, it has been impossible to enroll all applicants.

Of the money which will soon be available, \$100,000 will be set apart for the fifth High School, to be located near Lake street in the Eighth Ward. The remainder of the building fund will be used for the erection of grade schools. To this will be added from \$40,000 to \$60,000 obtained from other sources. With this sum the school board expects to be able to increase the school accommodations in several districts, which have been scantily provided with school facilities for a year.

Something will be done in the Rosedale district, probably by the erection of a new eight-room building. The Lake Harriet district is inadequately provided and will be cared for. The Sidney Pratt school in Prospect Park has been badly overcrowded since last September, and relief will be given there. In Northeast Minneapolis there is some congestion, which will be relieved by the erection of an addition to one of the old schools.

The school directors expect to have all these additions ready for occupancy by next September.

Cincinnati Street Car Service

A NEW City Department, to have charge of the street car service, has been recommended by the Street Railroad Committee of the Business Men's Club of Cincinnati, and the project has been approved by Mayor Dempsey. It is planned to have a corps of city inspectors to investigate complaints about the service, and to enforce the regulations, besides making recommendations to the Mayor and City Council for additional safeguards in the public interest. No definite action can be taken on the matter until the new apportionment of funds in July. In the meantime, plans will be perfected, so that early action may be taken.

AMENDING NEWBURGH, N. Y., CHARTER**Two Proposed Systems of Inaugurating Street Improvements—Definite Action Deferred
—The City's Debt**

A RECENT special meeting of the Newburgh, N. Y., Common Council, called to consider charter amendments designed to facilitate the paving of streets, was largely attended. The proposed amendments, drawn up by the Business Men's Association, provide two systems of inaugurating street improvements—on initiative of the property owners by petition of one-third of the owners of abutting property or by action originating with the Board of Works; in either case the city is to pay one-third and the property owners two-thirds of the cost of improvements, to be carried on under the direction of the Board of Public Works. There was considerable opposition to the amendment removing the present limit of \$50,000 per annum for permanent improvements and it was finally agreed to fix a limit to such improvements at \$100,000 per annum.

The assessed valuation of the city is \$11,000,000, and as the debt is \$700,000, it is \$400,000 below the 10 per cent. limit allowable under the State law. Objections were made to other provisions of the amendments. Ex-Governor Benjamin F. Odell assured the gentlemen present that the Business Men's Association had done nothing but what was intended to help the city along in the provisions that had been proposed.

"One thing is certain," said the former Governor; "you can't expect to throw obstacles in the way of improvements and then expect to prosper. Pass the amended charter and it will be a benefit to the city and will be recognized as such within a year." No definite action was taken.

Grouping of Public Buildings

THE action of a committee of the City Council of Cleveland, Ohio, in approving the purchase of property from the Case estate assures the consummation of the plan for the grouping of public buildings in the centre of the city. The present purchase involved an outlay of \$1,900,000, and includes land outside of the area of the civic centre, as now planned.

Knoxville Must Build Plant

THE City Council of Knoxville, Tenn., has adopted a resolution providing for the sale of \$750,000 bonds for municipal water-works. The Knoxville Water Company submitted a proposition to sell its plant, assessed at \$518,690, for \$1,130,000; but the City Council is not empowered to purchase the plant under the provisions of the Act authorizing the bond issue.

City Retains Control of Plant

THE City Council of Linton, Ind., has rejected plans for disposing of the municipal electric light plant. The Indiana Electric Transmission Company of Lafayette, Ind.,

offered to take over all the bonded indebtedness of the plant, \$16,500; to give the city \$10,000 worth of preferred stock, and continue the present rate for lighting. The Light, Fuel and Gas Company offered to assume the bonded indebtedness and pay \$5,000 for a franchise. R. S. Ashe of Richmond, Ind., an electrical contractor and engineer, wanted to loan the city funds and to sell the supplies for rebuilding, or to purchase the plant outright.

The Buffalo Lighting Plant

FOR the establishment of an electric-light plant at Buffalo, N. Y., bonds for \$3,000,000 will be issued as soon as the necessary authority is secured from the Legislature. Aldermen Collins and Haffa, who recently appeared before the Committee on Laws and Legislation, entered an objection to the feature of the bill giving the proposed Commission absolute power to construct the plant. They contend that the Common Council should have power to pass on these contracts, as on all contracts of the Board of Public Works. Efforts are to be made to secure an early appropriation of \$250,000 for the work.

Paving for Minneapolis

THE streets of Minneapolis, Minn., will be put in good condition for the visit of the Grand Army of the Republic in the fall. It is planned to resurface all asphalt streets, which have an area of 113,000 square yards, or about seven miles, outside of Park avenue. At no time has the city had all its streets in first-class condition at the same time. The contract for improvements will be executed this month, so that work may begin early in April. The local plant has a daily capacity of about 1,500 yards, and it is expected the work can be completed in July. This paving will cost approximately \$150,000.

Rewards for Mosquitoes

THE New Orleans, La., Board of Health has offered prizes to citizens who discover the first *stegomyia* mosquito, which is credited with carrying yellow fever germs, and the office has been besieged by people with every variety of insect. Not a single specimen of the fever mosquito has been found, however, and it is believed that few, if any, survived the campaign against the pest last summer.

Insanitary Laundries

SEATTLE, WASH., has started a crusade against insanitary Chinese laundries. Dr. William L. Ludlow, City Health Officer, has issued orders to thirty such establishments to remedy present conditions or close. An inspection of the laundries, lasting for several days, has revealed the fact that many of the places operated by Chinamen are hotbeds of disease, endangering the public health.

A Model Report

THE annual report of Comptroller Louis Betz, of St. Paul, Minn., is along similar lines to those laid down by the United States Census Bureau, which compiles the annual statistics of the cities. Facts and figures are presented in concise form, as are also comparative statements.

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Our readers are invited to contribute to the **MUNICIPAL JOURNAL AND ENGINEER**, either in the form of special articles or of letters discussing matters of current interest.

It is also desired that the facilities furnished by the reference library in this office should be widely known and freely used by those interested in municipal affairs. Visitors will be welcomed and provided with conveniences for search, and inquiries by mail will be promptly dealt with.

NEW YORK, MARCH 21, 1906.

Municipal Ownership

"I believe that the people of a community should not enter lightly into a municipal enterprise. They should carefully study the arguments for and against, and, above all, each new proposition should be studied alone.

"No people should say that they will own all or will not own any public utility. There may be as good reasons for engaging in one as for not engaging in another."—(Mayor Tom L. Johnson.)

AMONG the subjects connected with that of municipal government which an awakened popular interest is at present earnestly considering, probably none is more important than that of municipal ownership. Among the two or three men of the country who are, in the minds of the public, most closely connected with this question as its prophets and advocates the author of the above stands prominent and influential. There is therefore, on account of their author, a special significance in these paragraphs (quoted from the paper on "Municipal Ownership" which appeared in the February **JOURNAL**, in which Mayor Johnson briefly set forth his views on the subject), and the attention of our readers is called to them because they sound a warning that municipal ownership is not a panacea for all municipal ills. They should also suggest some serious considerations both to the enthusiastic exponents of the intrinsic benefits of universal municipal ownership, and also to the citizens who, while they display sufficient civic interest to realize the need of changes in municipal methods, do not carry this interest far enough, but turn to the first ready-made remedy which is for the moment receiving popular approval, rather than give the time and take the trouble to investigate thoroughly its applicability to the case in question or the possibility of there being a more advantageous solution; like a man who would endeavor to cure his child of scarlet fever by the use of a remedy which his neighbor found excellent for grip.

On the latter class especially is it desirable that this idea be impressed. It is proper, desirable, even necessary that

every good idea for municipal betterment should have its enthusiastic advocates. But the general public, in which rests the final decision, is but partially roused from its apathy if, after being made to see the evil, it accepts without the most thorough investigation this or any other alleged remedy therefor, the application of which may, under certain conditions, result in an even worse evil than that which it was intended to cure. Municipal ownership is a most effective remedy but not a universal one.

Chicago Railway Franchises

THE recent decision of the United States Supreme Court in the case of street railway companies against the city of Chicago has been received with satisfaction throughout the country. The whole theory of this decision appears as a reaffirmation of the right of municipalities to regulate the use of streets and to control public service corporations.

Within the original corporate limits of the city of Chicago a number of street railway companies operate under a 99-year franchise, passed in 1865. As the city extended its limits, the street railway companies added to their lines, under grants of short-term franchises. The companies set up the claim that the 99-year grant included the extension of the short-term franchise. The United States Supreme Court hold that no matter for what period the charters were granted by the Legislature, the life of the subsidiary franchises depends upon the contract with the city. Under this decision a large number of franchises have already expired and the railway companies have only property right in the improvements.

A Good Roads Convention

At a recent Good Roads Convention at Sacramento, Cal., held under the auspices of the Sacramento Valley Development Association, a resolution was introduced petitioning the Legislature to require the Board of Prison Directors to employ 500 convicts in quarrying rock for road building. Nathaniel Ellery, State Highway Commissioner, read a paper entitled "Commercial Value of Good Roads," which was discussed by the delegates, among whom were members of the Boards of Supervisors from counties in the Sacramento Valley.

Budget of Hartford, Conn.

THE Budget of Hartford, Conn., for the next fiscal year calls for an appropriation of \$1,533,968.75, and a contingent fund of \$38,831.25, making a total of \$1,572,800. Of this amount, \$310,099.75 is allotted the Street Department; \$152,000 for the Fire Department; \$136,561 for the Police Department; \$41,500 for the Park Department and \$15,940 for the Water Department, to include the purchase price of 1,022 hydrants, \$15,330.

Veteran Fire Chief Retires

JAMES E. PARSONS, for twenty years Chief Engineer of the Richmond, Ind., Fire Department, has resigned because of ill health. He joined the Department in 1871, and was made Chief in 1886.

PLANS TO BEAUTIFY CITIES

Andrew Wright Crawford Tells of Work Here and Abroad —Engineers Should Solve Problem—Washington and Paris

IN speaking before the Municipal Art Society at Hartford, Conn., on "City Plans and the City Beautiful," Andrew Wright Crawford, Corporation Counsel of Philadelphia, and Secretary of the city's allied organizations, told of the work in various localities. "When cities begin to consider the most desirable locations for parks," he said, "it has been found, as a rule, that the places most desirable are threatened by proposed new streets, without any study of the natural beauties of the country." An illustration of this, said Mr. Crawford, was shown in Philadelphia, when the city's Bureau of Surveys demolished a house in which Benjamin Franklin lived, in order to straighten an outlying street.

"Washington and Buffalo are among the most beautiful cities," said Mr. Crawford. "L'Enfant planned Washington in 1800, and Haussman adopted the plan for Paris sixty years later, yet many think Washington was copied after Paris.

"Each city has its own problems, but the city engineers should try to solve them so that the streets shall provide direct and easy means of communication," Mr. Crawford continued. "The streets ought not to bisect places of natural beauty that should become parks and public playgrounds. The streets should present opportunities for embellishment, where naturally there are none, and all streets which together constitute the city plan should lead the city, consciously or unconsciously, to realize all the possibilities of beauty already given it by nature and all that can be given to it by municipal art."

Mr. Crawford was asked by City Engineer Ford about Park river being covered in and converted into a sewer and said that in Europe they always improve streams in such a situation, remove all pollution therefrom and beautify them.

A Hundred-Mile Speedway

THE promoters of the Pennington automobile track—a private speedway for the testing of high-speed cars—are inclined to unite their interests with advocates of the broad highway for motor cars from Jersey City to Philadelphia. One of the most prominent projectors of the Pennington speedway plan, Mr. Emerson Brooks, is quoted as saying:

"The directors of the Pennington track who reside in Trenton are heartily in favor of the New York-Philadelphia highway. The first effort in this direction will be to obtain an estimate of the cost of building the highway, as well as the expense of securing the rights of way. Our estimates, made by experienced engineers, show that the track could not be built for less than \$24,000 per mile, and I think this will correctly represent the cost of the 100-mile route to Philadelphia."

A roadway, 80 feet wide, and a mile long, contains

about 46,000 square yards; as good macadamizing is rarely done for less than 50 cents per square yard and to this must be added the cost of extra grading and culverts, it is difficult to see how the total cost of the proposed roadway can be less than two million and a half dollars. If it should be necessary to effect a saving on this estimate, the most practicable way would be to narrow the roadway in the less important sections.

Such a speedway might be used for cup races of national interest and would attract crowds whose expenditures would eventually compensate the cost of construction. The automobilists interested in the Pennington project would willingly contribute, it is believed, a share of the cost, and the general public would be benefited through the establishment of regular automobile passenger lines, thus bringing the luxury of automobiling within reach of the average citizen.

"The Electrolysis Danger"

NEW YORK CITY, March 10, 1906.
34 Nassau street,

The Editor, MUNICIPAL JOURNAL AND ENGINEER:

Sir,—My attention has been called to an article entitled "The Electrolysis Danger" on page 192 of your issue of February 28, which refers to my report on the conditions discovered in the City of Detroit. It seems to call for some explanation from me, as your informant appears to have obtained an incorrect idea of the same.

The statements that "the system of protection in use is approved by Mr. Knudson" and that "portions of the mains are wound with copper wire and connected either with the street car rails or with overhead return wires" are not only incorrect, but an injustice to me, as by that it would appear that I approve methods to which I have long been opposed. While I have no authority to give portions of the report for publication, I may say, what is generally known, that for years a system of bonding rails to mains has been in vogue in the danger areas in Detroit, and has been added to each year, not, however, by "wrapping the mains with copper wire." It was not deemed advisable to disturb this system until a better method, such as an insulated trolley return, is decided upon. This "system of protection" was not only not approved by me, but its disadvantages through practical use were pointed out and will appear in the published report.

Yours truly,

A. A. KNUDSON.

Improved Harbor for Milwaukee

THE matter of harbor improvement at Milwaukee, Wis., bringing that city into closer touch commercially with Chicago and other points along the lakes, has advanced beyond the preliminary stage, definite plans having been prepared for dredging a 100-foot channel, and for excavating four turning basins, one in the Monominee and three in the Kinnickinnic rivers. A second channel, from 100 to 150 feet in width will be dredged from the mouth of the Menominee to the harbor entrance. It will require several years to complete this work, which will cost approximately \$318,550.

Municipal Street Cars of Lincoln

THE question of municipal ownership of the street railway system of Lincoln, Neb., will be decided by vote of the people. This is the unanimous decision of the Commercial Club, to which the matter was referred by a mass-meeting of citizens. The agitation has resulted from the inability of the city to satisfy a tax lien held against the company. Should it be deemed inadvisable to acquire the present system, it is recommended that the city build and equip a new system, paralleling the existing lines.

Public Utilities of Charleston, W. Va.

THE PUBLIC UTILITIES OF CHARLESTON, W. VA., have all been absorbed by W. E. Chilton and associates. The latest deal was the taking over of the Kanawha Light and Water Company, including the franchises and property of the Kanawha Gas Company, recently secured by the Water and Light Company. The transaction is the largest ever consummated in the city, giving the same interests control of the Traction Company, The Water and Electric Light Company, the Kanawha Natural Gas Company, and the Artificial Gas Company, all of which were, until recently, independent concerns.

Shade Trees at Newark, N. J.

THE Newark, N. J., Shade Tree Commission is planning to set out two thousand young trees, the work to begin the latter part of this month. Although this approximates the total number hitherto set out, and will provide for seven or eight miles of streets, the Commission can go on for five years at the same rate without exceeding the needs of the city. Streets leading to the parks are given the preference in this work, especially if paved and curbed.

Garbage Crematory for Seattle

SEATTLE, WASH., is nearing the stage when a \$30,000 garbage crematory will be added to its possessions and responsibilities. It is proposed to install the plant in the heart of the city, City Engineer Thomson being most optimistic in this respect as the result of his recent official inspection of European installations. He contemplates the organization of a city collection department, so as to do away with the present contract system, and anticipates that, in course of time, the crematory plant will almost pay its own running expenses.

Municipal Churches

BIRMINGHAM, ALA., now owns churches, hospitals and private residences, in addition to the property usually held by a municipality. The property was bought at a recent sale, ordered by the city to cover tax assessments for street improvements. One hospital brought but \$69.33 and another \$2,985.85, and the churches sold for from \$100 to \$500. The prices paid are only small fractions of the actual value. The law specifies that the property can be bought back by the original owners on payment of twice the price brought at the sale.

Public Affairs

THE STREETS OF JACKSONVILLE, FLA., will be sprinkled with a disinfectant during the summer.

UNIQUE ENGINEERING PROBLEMS are involved in the irrigation projects along the Colorado and Gila rivers in Arizona and California.

THE CITY COUNCIL OF TOLEDO, OHIO, is undecided whether to construct a straight bridge at Cherry street or a structure built on the viaduct plan.

THE MONROE COUNTY ROADS, near Rochester, N. Y., are to be sprinkled with westrumite during the coming summer by County Engineer McClintock.

MAYOR WOODWARD, OF ATLANTA, has signed a petition sent to President Roosevelt asking him to address the Convention of the League of American Municipalities, at Chicago, Ill., September 26-27-28.

THE LABORATORY OF THE GEORGIA BOARD OF HEALTH in the State Capitol, at Atlanta, has been fitted up with a modern plant for analyzing water. Under the new arrangement, analysis of water can be made without interfering with other experiments.

CITY OFFICIALS OF ST. JOSEPH, MO., have not received their salaries, owing to a controversy between the City Solicitor and the City Council relative to ordinances appropriating funds. Three appropriation bills passed early in the month have been declared invalid.

THE ABOLITION OF GRADE CROSSINGS is of vital importance in many cities throughout the country. In Minneapolis, Minn., civic and commercial bodies are giving the matter considerable attention and the City Council is being urged to take definite action.

THE BESSEMER, ALA., CITY COUNCIL has increased the salary of the City Engineer from \$1,500 to \$2,000, to secure the services of Major Parkes, who had been offered a position at Pine Bluff, Ark. Major Parkes will remain at Bessemer if the Pine Bluff officials release him from his obligation there.

THE MILK LAW OF TACOMA, WASH., has been declared invalid on the ground that it conflicts with the State law which prohibits cities from requiring a license to sell milk. The Court held, however, that the city can pass an ordinance, imposing a penalty for furnishing adulterated, watered or impure milk, and fixing a legal standard of quality.

THE TOWN OF NORTHFIELD, VT., having had a year's experience with a modified form of municipal lighting, has decided, by a unanimous vote in town meeting, to continue it for ten years more. Current is purchased from the firm of Moody & Almon, and transformed at a small station in the central village, where the responsibility of the sellers ceases. The town owns the poles and wires, erects its own lamps, wires buildings for lighting, makes repairs and collects bills. The original municipal plant, erected a dozen years ago at a cost of \$30,000, was destroyed by fire in October, 1904.

City Brevities

SOUTH BEND, IND., has contracted with Dudley M. Shively to furnish 85-cent gas to the city.

ROCHESTER, N. Y., officials predict that 1906 will be a record-breaker in the matter of public improvements.

SPRINGFIELD, MASS., has a Commission to consider matters pertaining to the construction of a new City Hall.

FOND DU LAC, WIS., may secure lower rates for street lighting as the result of a fight between rival lighting companies.

FULTON, N. Y., finds itself without engineers and firemen to operate its fire engines, the Department being short-handed.

LYNN, MASS., is investigating the management of the Water Department, especially regarding the construction of a dam at Walden pond.

IRONDEQUOIT, N. Y., has signed a contract with the Rochester & Lake Ontario Water Company and has laid out a water supply district.

PADUCAH, KY., BOARD OF ALDERMEN is considering whether to award a contract for street lighting or to build and operate a municipal plant.

JACKSONVILLE, FLA., had twenty-seven bidders for the \$400,000 municipal improvement bonds sold to Hambleton & Company, Baltimore, Md.

NORFOLK, VA., has appointed a committee to prepare plans for a boulevard from Norfolk to Sewall's Point, the site of the Jamestown Exposition.

INDIANAPOLIS, IND., has a smoke inspector, David C. Walmsley, who is a mechanical engineer. Mayor Bookwalter has instructed him to enforce the law.

INDIANAPOLIS, IND., insists that contractors repair all streets on which the guaranty period has not expired; otherwise they will be refused new contracts.

RICHMOND, VA., has appropriated \$10,000 for manual training and kindergarten schools. A delegation of women urges that \$13,500 be expended for the purpose.

PORT HURON, MICH., is in excellent financial standing, according to Comptroller E. A. Cady. At the close of the fiscal year, in April, the city will have a balance of nearly \$100,000 in bank.

HAMILTON, OHIO, has accepted the resignation of John F. Heath, Secretary of the City Gas and Electric Light Department, and has directed that the remaining employees furnish bonds.

WILMINGTON, DEL., Street and Sewer Commissioners are considering an application of a private corporation to lay pipes through the city to supply water for the Pennsylvania Railroad Company.

MOUNT HOLLY, N. J., demands that the Public Service Corporation furnish dollar gas. The price for electricity is also regarded as too high. Municipal ownership of a lighting plant may be the outcome.

Trade Notes

THE UNITED COKE AND GAS COMPANY, 17 Battery Place, New York City, has issued a handsome volume of 146 pages, 9 X 12 inches, in which the destructive distillation of bituminous coal is treated with special reference to the United-Otto system of by-product coke ovens. The volume forms a complete treatise on gas making by modern methods, with sufficient historical matter to show the advances made, these applying with special force to the matter of by-products and their utilization. Printed in the best style of typography, on heavy faced paper, the volume would be valuable even without the numerous excellent illustrations. As it stands, it is little short of monumental in its scope and completeness, and will be sought after by all who desire to possess, in this condensed form, information on a subject whose literature is scattered over a wide area.

THE POWER AND MACHINERY COMPANY, Cudahy, Wis., (suburb of Milwaukee) will shortly issue a second edition of Catalogue No. 4, dealing with rock-crushing plants. The former edition has been thoroughly revised to conform with the latest and best engineering practice, so as to form a 72-page publication, which will be sent, upon request, to those interested in modern crushing plants and equipments.

THE JOHNSON WELL SCREEN is the subject of a leaflet issued by the maker, E. E. Johnson, St. Paul, Minn., in which the advantages of this well-pipe lining are set forth. Being made of brass, strong, and with ample inlet opening, it is not liable to choke and can be fitted, in sections, to pipes from two to twelve inches in diameter.

COLUMBUS, OHIO, is considering an ordinance under which \$29,000 would be expended on the erection and equipment of a garbage incinerating plant. Direct collection of the refuse is contemplated.

LINCOLN, NEB., citizens will vote on municipal ownership of the local street railway. It is recommended by the business men's committee that in case the present system is not purchased, the city shall build parallel tracks, a power station, and light plant.

CHARLESTON, S. C., having provided city sewers in nearly every street below Broad street, has fixed May 1 as the limit of time for making house connections. The extension of the sewerage system beyond Broad street is to be taken in hand at a cost of \$40,000.

SYRACUSE, N. Y., officials, including school teachers, policemen and firemen, have not been paid their salaries for three months, on account of the delay in passing the tax budget. An ordinance has been introduced, authorizing a temporary loan of \$300,000 to pay off these and other current expenses.

THE WEEK'S CONTRACT NEWS

RELATING TO MUNICIPAL AND PUBLIC WORK—THE CONSTRUCTION FIELD—PROPOSALS AND CONTRACTS—
SEWERAGE AND WATER SUPPLY, STREET IMPROVEMENT AND LIGHTING—FIRE EQUIPMENT
—BUILDINGS

STREET IMPROVEMENTS

Bessemer, Ala.—The matter of issuing bonds for street improvements will be decided at the spring election.

San Francisco, Cal.—Plans are being prepared for repaving Ellis street between Market and Larkin streets with asphalt; estimate, \$27,000.

Sacramento, Cal.—Portions of Seventh, Eighth and Ninth streets will be macadamized and cement curbs and gutters laid, and portions of J and K streets paved with asphalt.

Denver, Colo.—The Board of Public Works has obtained plans for street improvements in East Side District No. 1. Some paving will be undertaken; vitrified pipe culverts must be constructed and curbing and gutters built. The estimated cost is \$131,630. Bids have not yet been invited.

Boise, Idaho.—Plans for paving several streets are before the City Council—C. J. Sinsel, Chairman, City Committee.

Belleville, Ill.—We are informed that ordinances have been approved for paving Abend and Charles streets, and Freeburg and Mascoutah avenues.—L. L. Harper, City Engineer; Gustav H. Beineke, City Clerk.

Edwardsville, Ill.—Proposals are asked by the Board of Public Service, until March 22, for constructing vitrified brick pavements on concrete foundation.—Charles A. Sheppard, Engineer.

Elgin, Ill.—National street will be paved with brick on a five-inch concrete base.—Henry Dakin, City Engineer.

Evanston, Ill.—It is reported that plans have been approved for constructing a macadam pavement in University Place.

La Salle, Ill.—Bids will shortly be invited for constructing approximately 64,000 square yards of brick paving at a cost of \$80,000.—W. A. Panneck, Mayor; Edward Byrne, City Engineer.

Moline, Ill.—It is estimated that the proposed paving of Fourth avenue, East, will cost \$40,000. Plans have been approved by the Board of Public Works.

Rock Island, Ill.—The City Council has decided to pave a portion of Sixteenth street with asphalt.

Springfield, Ill.—An ordinance has been approved for paving Second street with brick.

Streator, Ill.—Bids will be asked, about May 1, for constructing 40,000 square yards of brick paving. The estimated cost is \$65,000.—C. A. Herbert, City Engineer.

Bloomfield, Ind.—The Sotekton Township road bonds have been sold for \$31,255.

Delphi, Ind.—The City Council is considering ordinances for paving several streets.

Petersburg, Ind.—Plans are being prepared for constructing twenty-five miles of gravel road in Pike County, and bids will shortly be invited.

Wabash, Ind.—Bids are wanted for constructing 50,000 square feet of cement sidewalks.—John Hilly, City Engineer.

Emporia, Kan.—The City Council has ordered the paving of Union street.—G. O. Mattawson, City Clerk.

Fort Scott, Kan.—The City Council is considering plans for paving National avenue.

Paducah, Ky.—Fifteen blocks will shortly be improved. Some paving will be done.—City Engineer Washington.

Paducah, Ky.—It is reported that ordinances are before the City Council for improving Sowell street and Hayes avenue.

Fall River, Mass.—It is reported that bids will shortly be asked for furnishing 250,000 granite paving blocks.

Lowell, Mass.—Petitions have been presented to the City Council for paving Moody, Worthen and Middlesex streets. No definite action has yet been taken.

Adrian, Mich.—The Board of Public Works is considering plans for paving several streets with brick; estimated cost, \$15,000.—James Blair, City Engineer.

Ann Arbor, Mich.—The cost of paving William street with brick is estimated at \$20,000. Other material may be substituted.—City Engineer Groves.

Lansing, Mich.—The City Council is considering plans for paving Michigan Avenue; estimated cost, \$55,878; also for improving Franklin Avenue at a cost of \$17,520.—H. A. Collar, City Engineer.

Manistee, Mich.—It is reported that the contract for paving River street has been awarded to the Central Bitulithic Company for \$39,000.

Port Huron, Mich.—The Board of Estimate has approved a proposition to issue \$15,400 in bonds for repaving portions of Pine Grove avenue.

St. Joseph, Mich.—The citizens will shortly vote on the proposed issue of \$29,500 in bonds for improving roads.

Duluth, Minn.—Preliminary plans for paving several streets involve an expenditure during the year of \$127,000.—Thomas F. McGilvray, City Engineer.

Hallock, Minn.—The City Council is considering a \$5,000 bond issue for constructing roads.

Minneapolis, Minn.—Plans and specifications for paving a number of streets are before the Board of Public Works.

St. Paul, Minn.—Proposals are invited, until March 22, for paving portions of John street with sand-lime brick.—John S. Grode, President, Board of Public Works.

Jackson, Miss.—Legislative bills provide for issuing \$250,000 paving bonds and for paving around the Capitol; one mile of State street may also be paved.—Ramsey Wharton, Mayor.

St. Joseph, Mo.—The Board of Public Works has prepared plans for paving eleven streets, aggregating 7 miles, or 150,000 square yards, with vitrified brick. Ordinances authorizing the work are before the City Council.—B. F. Buzard, President, Board of Public Works; W. H. Floyd, City Engineer.

Omaha, Neb.—The City Council will consider preliminary plans for constructing a viaduct over the railroad at Arbor and Martha streets.

Alexandria Bay, N. Y.—Preliminary plans are being prepared for constructing macadam streets; approximately 4 miles of pavement will be required.—J. S. Keeler, Engineer.

Chatham, N. Y.—The Board of Supervisors will construct a State road $3\frac{1}{4}$ miles long, extending from Chatham to Spencertown.

New York, N. Y.—Plans are being prepared by the Bureau of Highways for improving Seventh avenue, 110th to 153rd street, by paving with asphalt; estimated cost, \$262,000. Proposals will be asked in February.

Penn Yan, N. Y.—The citizens will vote on the question of paving Jacob street at a cost of \$15,000.

Plattsburgh, N. Y.—Proposals will be received, April 6, for furnishing material and constructing approximately 5,000 square rods of asphalt block pavement along Bridge street; also for the construction of concrete gutter and curb, aggregating 3,800 lineal feet.—R. E. Hyde, Mayor; T. W. Walley, Clerk, Board of Public Works.

Rochester, N. Y.—The city will pave portions of Sullivan, Hoeltzer, Clifford, Fourth, Third and Second streets, Atlantic avenue and Avenue D with brick at \$168,050; also portions of Cleveland place, Park and Anderson avenues and Milburn street with asphalt, at \$79,500.

Syracuse, N. Y.—Estimates have been prepared for paving Lowell avenue and Harrison and Clover streets.

Troy, N. Y.—The Common Council has approved an ordinance for paving Hawthorne street.

West Seneca, N. Y.—Preliminary plans are being prepared for paving Ridge road; estimated cost, \$75,000.

Ashland, Ohio.—The City Council has approved the resolution to bond the town for paving Highland avenue.

Bucyrus, Ohio.—Proposals will shortly be invited for paving twelve blocks with brick.—C. R. Guise, City Engineer.

Columbus, Ohio.—Bids will be invited shortly for paving Hamilton avenue, School street and Felton avenue.

Dayton, Ohio.—Preliminary plans have been prepared for paving Williams street with brick. The cost will approximate \$21,000.—W. F. Miller, City Clerk; R. E. Kline, City Engineer.

Delaware, Ohio.—Proposals are invited, until April 9, for constructing brick and cement sidewalks in several districts.—F. D. King, City Clerk.

Elyria, Ohio.—It is proposed to pave Washington Hill avenue from Broad street to the railroad.

Greenville, Ohio.—Plans are being prepared to pave East Main street with brick; also East Third street with asphalt blocks.—City Engineer Slade.

Lebanon, Ohio.—Bids will be opened, April 6, for constructing concrete sidewalks in several streets.—C. C. Eulass, City Treasurer.

Marietta, Ohio.—The proposed paving of Fort street is under consideration.

Marion, Ohio.—New pavements will probably be laid on Franklin and Columbia streets.

Norwalk, Ohio.—A resolution has been approved for paving Benedict avenue with brick.

Portsmouth, Ohio.—Ordinances for paving Market, Fifth and John streets are before the City Council.

Youngstown, Ohio.—McGuthrie street, Wilson avenue, East Woodland avenue, School street, Watt street, McGutty street and Market street will be improved in the spring.

Altoona, Pa.—We are informed that \$300,000 is available for new paving this year. Approximately 7 miles of brick paving on concrete foundation is being considered in various ordinances.—Harvey Linton, City Engineer.

Reading, Pa.—Four new streets will be opened this spring. Preliminary plans have been prepared, together with estimates.

York, Pa.—The County Commissioners have appropriated \$4,800 for reconstructing one-half mile of the old State road in Carroll Township, near Dillsburg. Plans must be approved by State Highway Commissioner Hunter.

Spartanburg S. C.—The city will expend \$10,000 on street improvements.

Chattanooga, Tenn.—The Southern Paving and Construction Company has secured the contract for paving several streets at a cost of \$7,984.

Knoxville, Tenn.—Plans and specifications are being prepared for paving a number of streets. The total cost will be \$80,000.—W. C. Crozer, City Engineer.

Memphis, Tenn.—It is proposed to ask bids for opening and improving five miles of streets at a cost of \$200,000.—James A. Omberg, jr., City Engineer.

Bonham, Tex.—The question of issuing \$150,000 Fannin County road bonds will be decided at an election to be held shortly.

Sherman, Tex.—The citizens have voted to issue \$20,000 paving bonds.

Tyler, Tex.—The Attorney General has authority to issue bonds for paving purposes.

Salt Lake City, Utah.—Plans involving the expenditure of \$400,000 for street improvements, including considerable paving, are before the Board of Public Works.

Norfolk, Va.—The City Council has plans for improving Queen street at a cost of \$5,000. Belgian block may be used for paving.

Phoebe, Va.—Plans and specifications are being prepared for approximately 26,000 square yards of paving. Contracts will be awarded during the spring. Materials being considered are granite block, asphalt block, vitrified brick and bitulithic.—L. P. Furness, Mayor.

Suffolk, Va.—The Town Council will issue \$150,000 bonds for street and sidewalk improvements.

Seattle, Wash.—It is stated that approximately \$500,000 will be expended for street paving. Several ordinances have already been approved. Preliminary surveys are being made for paving Fifth avenue, North district.—R. H. Thomson, City Engineer.

La Crosse, Wis.—The property owners of Planigons street have petitioned for brick paving.

Racine, Wis.—It is reported that the Board of Public Works will shortly advertise for bids for paving Wisconsin avenue with asphalt.—P. H. Connolly, City Engineer.

SEWERS

North Birmingham, Ala.—It is stated that \$100,000 in bonds will shortly be issued for building sewers.

Belleville, Ill.—Sewers will be constructed in Abend and Charles streets; also in Freeburg and Mascoutah avenues.—L. L. Harper, City Engineer; Gustav H. Beineke, City Clerk.

Highwood, Ill.—The Town Board has approved plans for constructing a 10-inch sewer in Waukegan avenue.

Joliet, Ill.—It is reported that proposals are wanted for constructing sewers in Benton and Cassidy streets; also in Second avenue.

Lacon, Ill.—Sewers will be constructed in several streets.—Robert Thiedohr, City Clerk.

Indianapolis, Ind.—The Board of Public Works will shortly ask bids for constructing a trunk sewer in West Indianapolis and Haughville. The estimated cost is \$150,000.

Princeton, Ind.—Proposals are being received for the construction of sanitary sewers; also of a septic tank; estimated total cost, \$94,000.

Ardmore, Ind. Ter.—Bonds for \$35,000 for constructing sewers may be authorized at the spring election, April 7.

Sapulpa, Ind. Ter.—Plans have been prepared for constructing sewers at a cost of \$44,000.

Fort Dodge, Iowa.—Bids will be asked, about May 1, for laying a pipe sewer in First avenue South.—C. H. Reynolds, City Engineer.

Georgetown, Ky.—Proposals are invited, until April 11, for constructing 4 miles of sewers.—R. H. Anderson, Mayor; D. A. Adams, City Clerk.

Ann Arbor, Mich.—Sewers will shortly be constructed in several streets. Preliminary plans have been prepared.

Detroit, Mich.—The Common Council has ordered that bids be asked for constructing seven lateral sewers. Plans are being prepared.—J. J. Haarer, Commissioner of Public Works.

Duluth, Minn.—The City Council has ordered the construction of sanitary sewers in Third street.

St. Paul, Minn.—The City Council is considering plans for building sewers in the Eighth Ward; estimated cost, \$70,000.

St. Joseph, Mo.—City Engineer Floyd is preparing plans and estimates for constructing 20 miles of vitrified pipe sewers. The sizes will vary from ten to thirty inches.—W. H. Floyd, City Engineer.

Merchantville, N. J.—An election will be held, April 17, to determine whether the town will issue \$80,000 in bonds for constructing sewers.

Fulton, N. Y.—Bonds for \$10,000 will be issued for constructing sewers.

Wilmington, N. C.—An ordinance before the City Council provides for a \$250,000 bond issue for constructing sewers.

Akron, Ohio.—Plans have been approved for constructing a storm sewer from Iron street to the canal.

Ashland, Ohio.—It is reported that bonds will shortly be issued for building additional sewers.—A. P. Black, City Clerk.

Cleveland, Ohio.—Proposals are invited, until March 22, for building sewers in several streets.—W. J. Springhorn, Clerk, Board of Public Works.

Cuyahoga Falls, Ohio.—It is proposed to

construct sewers at a cost of \$40,000. Preliminary plans will shortly be presented to the State Board of Health at Columbus.

Delaware, Ohio. It is reported that a sewage disposal plant will be constructed at the Girls' Home. A \$15,000 appropriation is pending before the State Legislature.

Elyria, Ohio.—The building of new sewers is being considered.—C. M. Theobald, City Engineer.

Wauseon, Ohio.—Sewers will be constructed in Ottokee, Willow and Maple streets.—Charles J. Hodges, Chairman, City Committee.

Altoona, Pa.—Preliminary plans have been prepared for constructing storm sewers. It is stated that a system of sewage disposal may also be installed.—Harvey Linton, City Engineer.

Erie, Pa.—Proposals are invited, until March 31, for constructing a 9-inch sewer.—B. E. Briggs, City Engineer.

Franklin, Pa.—Proposals are asked, until March 27, for constructing sewers.—W. T. Pace, Secretary, Board of Public Works.

Pittsburg, Pa.—The Stowe Township Commissioners have approved an ordinance for a \$30,000 bond issue for building sewers. Preliminary plans have been prepared.

West Chester, Pa.—A special election will shortly be held to decide the question of issuing \$25,000 in bonds for building sewers.

Salt Lake City, Utah.—It is stated that the Board of Public Works has plans involving the expenditure of \$400,000 for constructing sewers and paving streets.

Prosser, Wash.—A sewerage system will be constructed in the business district; approximately one and a quarter miles of sewers must be built.

Seattle, Wash.—Plans are being prepared for building additional sewers; estimated cost, \$110,000.—R. H. Thomson, City Engineer.

Spokane, Wash.—Extensive sewer construction in Southeast Spokane will cost approximately \$300,000.

Toronto, Canada.—It is reported that the proposed sewerage system and septic tank, for which plans have been prepared, will cost approximately \$2,300,000.

WATER SUPPLY

LaJunta, Colo.—Bonds for \$50,000 will be issued for the purchase of the local waterworks.

Joliet, Ill.—Proposals are asked for laying water mains in Benton, Cassidy and Richmond streets, and in Second avenue.

Spring Lake, Mich.—The question of issuing \$15,000 in bonds for building waterworks will be decided at the spring election.

Raymond, Miss.—An election will shortly be held to authorize a \$5,000 bond issue for improving the waterworks.

Shelbina, Mo.—Mayor Ford is considering preliminary plans for building waterworks; estimated cost, \$22,389.

Trenton, N. J.—The Commission on water supply will spend \$100,000 to increase the capacity of the Delaware river pumping plant.—C. C. Haven, City Engineer.

Artesia, N. Mex.—It is reported that plans are being considered for the construction of waterworks, to cost \$50,000.

Ogdensburg, N. Y.—The proposed filter plant will cost approximately \$15,000.

Patchogue, L. I., N. Y.—Preliminary plans have been prepared for constructing waterworks.

Canton, Ohio.—Plans have been prepared for erecting a stand-pipe.

Cincinnati, Ohio.—Proposals will be opened, April 10, for laying all 6, 8 and 10-inch cast iron pipe and special castings required in connection with the waterworks prior to November 1, 1906.—E. G. Prior, Acting Clerk.

Dayton, Ohio.—Proposals are asked, until March 27, for the purchase of 1,000 water meters.—William F. Miller, City Clerk.

East Liverpool, Ohio.—The matter of erecting a filtration plant is being considered. The estimated cost is \$30,000.

Oberlin, Ohio.—The Board of Public Affairs is considering the matter of improvement of the water supply.

Vinton, Ohio.—Preliminary plans are being considered for the construction of waterworks.

Elk City, Okla. Ter.—An election will be held, March 26, to decide the question of issuing \$25,000 in bonds for constructing waterworks.

Philadelphia, Pa.—Plans are being considered for installing water meters throughout the city.

Newberry, S. C.—It is stated that \$10,000 in bonds will be issued for building waterworks.

Wessington Springs, S. D.—The City Council is considering plans for constructing waterworks.

Colonial Beach, Va.—The matter of constructing waterworks is being discussed.

Waukesha, Wis.—The question of issuing \$70,000 in bonds for building municipal waterworks will be decided at an early election.

Port Stanley, Ont., Canada.—It is reported that \$25,000 will be expended for constructing waterworks.

Winnipeg, Man., Canada.—Proposals are asked, until March 26, for furnishing quantities of water pipe; also water meters.—C. J. Brown, City Clerk.

PUBLIC LIGHTING

Goodwater, Ala.—The citizens have voted to issue bonds for the construction of an electric-light plant. Plans have been prepared and bids will shortly be asked.

Colorado City, Colo.—A city committee is considering a petition urging the erection of a municipal electric-light plant.—F. W. Baker, City Clerk.

Wilmington, Del.—It is reported that the

Wilmington Heat, Light and Power Company will shortly ask bids for the construction of a new power plant in the Ninth Ward. The cost will be nearly \$1,000,000.

Cartersville, Fla.—It is reported that the Town Council is considering plans for building an electric-light plant.

Marietta, Ind. Ter.—The citizens have voted to issue \$26,000 in bonds for erecting an electric-light plant and waterworks.

Shenandoah, Iowa.—It is reported that the Artificial Ice, Power and Light Company will shortly rebuild the electric-light plant at a cost of \$25,000.

Hopkinsville, Ky.—The local gas company will spend \$25,000 for extending its service lines and other improvements.

Eastport, Me.—The Eastport Electric Light has obtained preliminary plans for improvements to its plant. The cost will be \$10,000.

Mansfield, Mass.—It is stated that \$30,000 is available for the erection of an electric-light plant.

Alexandria, Minn.—Preliminary plans are being prepared for a new electric-light plant.

Aberdeen, Miss.—A new 250 Kw., Allis Chalmers alternator; also a 60 Kw. alternator with switchboard complete, will shortly be installed at the electric-light plant.

Seward, Neb.—The City Council is considering the matter of installing additional machinery at the electric-light plant.

Castile, N. Y.—An election will be held, March 29, to decide upon a proposed bond issue for building an electric-light plant.

Watertown, N. Y.—Plans are being prepared and bids will shortly be asked for erecting a new lighting plant.

Ellendale, N. D.—It is reported that a company has been formed to build an electric-light plant.—Mayor Leiby.

Dunkirk, Ohio.—The Town Council has granted H. O. Fisher a franchise for lighting the streets at \$72 per light a year.

Franklin, Ohio.—The City Clerk has been instructed to advertise for bids for lighting the town.

Vinton, Ohio.—The Town Council is considering plans for constructing an electric-light plant.

Ione, Oregon.—Plans are before the City Council for the erection of a new electric-light plant.

Dunbar, Pa.—The matter of erecting an electric-light plant is being considered by a city committee. Preliminary plans have been prepared.

Moulton, Texas.—A franchise for installing an electric-light plant has been granted Frank Koenig, of Moulton.

Port Townsend, Wash.—A citizens' committee is forming plans for building an electric-light plant. A company will be organized to conduct the enterprise.

Brandon, Man., Canada.—The Great Western Power and Manufacturing Company, Petersboro, Ont., is negotiating for

the privilege of erecting a gas and electric-power plant at Brandon.

Canning, N. S., Canada.—An electric-light plant will shortly be erected by the Kerr Vegetable Evaporating Company.

FIRE DEPARTMENT SUPPLIES

North Pasadena, Cal.—The City Council is considering the matter of expending \$13,000 for the erection of additional fire engine houses. New fire apparatus may be purchased.

San Jose, Cal.—The Board of Fire Commissioners has approved a resolution to purchase a combination chemical engine and hose wagon; also a combination hose and ladder wagon.—Secretary Griffiths.

Washington, D. C.—The Bureau of Supplies, Navy Department, will receive bids, until March 27, for furnishing a quantity of rubber fire hose at the United States Navy Yard, New Orleans, La.—H. T. B. Harris, Paymaster General, U. S. N.

Wichita, Kan.—Plans are being prepared for erecting a fire engine house on College Hill.

New Orleans, La.—The Board of Fire Commissioners has authorized the purchase of a new fire truck for the Sixth ward.

Independence, Mo.—The purchase of additional fire apparatus has been recommended by Fire Chief Kincaid.

St. Louis, Mo.—The City Council is considering plans for the erection of an engine house in the First ward.

College View, Neb.—A fire company has been organized and apparatus may be purchased.—Grant Cohser, Chief.

New York, N. Y.—The sum of \$450,000 has been appropriated for building new fire engine houses in the Boroughs of Manhattan and the Bronx.

Tarrytown, N. Y.—Additional fire hose may shortly be purchased.

Yonkers, N. Y.—It is reported that the National Board of Fire Underwriters recommends the purchase of a combination chemical and hose wagon for the local Fire Department.

Grand Forks, N. D.—The Chief of the Fire Department recommends the purchase of a chemical engine.

Folsom, Pa.—A new fire company is being organized in Ridley Township.

Wayne, Pa.—The Radnor Fire Company has been organized, and new fire apparatus will be purchased.—Charles M. Wilkins, Secretary.

Norfolk, Va.—The Fire Committee, City Council, recommends a \$25,000 bond issue for erecting new headquarters for the Fire Department.

PUBLIC BUILDINGS

Pine Bluff, Ark.—A number of architects have been asked to submit plans for a new High School building, to cost approximately \$50,000.—S. M. Taylor, President, Board of Education.

Griffin, Ga.—An election will be held, April 3, to decide the question of issuing \$17,000 in bonds for the erection of a new school house.—L. L. Bowmen, City Attorney.

Brighton, Ill.—The proposition to issue bonds for \$12,000 for school purposes has been approved.

Chicago, Ill.—Proposals are invited, until April 2, for the marble and tile work required at the Cook County Courthouse.—William McLaren, Superintendent, Board of Public Service.

Springfield, Ill.—It is reported that bids will shortly be asked for extensive repairs to the State House.

Logansport, Ind.—The School Board has approved preliminary plans for a new school building in the East End.

Ardmore, Ind. Ter.—An election will be held, April 7, to determine the question of issuing \$35,000 in bonds for school purposes.

St. Paul, Minn.—A new \$50,000 school building will be erected in South St. Paul. Bonds have been issued.

Virginia, Minn.—The citizens have voted to build a \$40,000 school building. Bonds may be issued.

Milan, Mo.—The date of the election for voting upon the question of issuing \$74,000 Sullivan County Courthouse bonds is April 24.

Omaha, Neb.—It is reported that the Douglas County Commissioners are considering a \$2,000,000 bond issue for erecting a new Courthouse.

Newark, N. J.—It is reported that the Finance Committee, City Council, will favorably report a resolution for a \$650,000 bond issue for school purposes.

Columbus, Ohio.—Ordinances are before the City Council to provide for erecting new engine houses in the Sixth ward.

Lima, Ohio.—The City Council has authorized a \$6,000 bond issue for erecting a new school building.

Mingo Junction, Ohio.—Bonds for \$55,-

000 will be issued during the spring for erecting a new school building.

Toledo, Ohio.—Improvements and repairs to city school buildings will cost approximately \$120,000 during the year. Plans are being prepared for additions to the Raymer, Spring, Ontario and Glenwood school buildings.

Oklahoma, Okla. Ter.—The City Council is considering plans for erecting a fire station in the West End district.

Shawnee, Okla. Ter.—The City Council is considering plans and estimates for the erection of a new building for the Fire Department.

Saint Johns, Oregon.—The matter of issuing bonds for the erection of a City Hall is under consideration.

Silverton, Oregon.—The Board of Education has approved a \$12,000 bond issue for erecting a new school building.

Sharon, Pa.—It is reported that bids will shortly be asked for building a new fire engine house.

Nashville, Tenn.—The question of issuing \$60,000 in bonds for the erection of a new Courthouse for Davidson County will come up at an early election.

Proposals for Street Lamps

SHARON, PA., March 19, 1906.

Sealed bids will be received at the office of the Secretary for the purchase of twenty-five (25) or more gas lamps complete for street purposes.

The right is reserved to reject any or all bids.

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Bertram, Texas.—The Town Council is considering the question of issuing bonds for building a new school house.

Dallas, Texas.—Plans have been completed for constructing the new High School at an estimated cost of \$134,000.—Lang and Witchell, Dallas, Texas, Architects.

Harrington, Wash.—Bonds for \$7,000 will shortly be issued for building new school houses.

Hamilton, Ont., Canada. — The Public Works Department will shortly ask bids for erecting an armory, to cost approximately \$175,000.—W. H. Stewart, Ottawa, Architect.

MISCELLANEOUS

San Francisco, Cal.—The Board of Supervisors will receive bids, April 9, for constructing the Geary street electric railway; estimated cost, \$328,000.

Savannah, Ga.—The construction of a municipal asphalt plant to repair the streets is urged by the Mayor in his annual report.

Evanston, Ill.—Proposals are invited, until March 23, for constructing the proposed \$100,000 public library building.

Quincy, Ill.—Three bridges will shortly be constructed, one each in Payson, Concord and Gilmore Townships.

La Fayette, La.—The City Council will sell bonds for \$100,000 for local improvements. A new school house will be erected

at a cost of \$60,000; the electric-light plant will be enlarged, and the City Hall repaired.

New Orleans, La.—Bids will be received, until March 28, for dredging at the mouth of the Calcasieu river; also for rebuilding rock revetments.—I. F. McIndow, Captain of Engineers, U. S. A.

Hattiesburg, Miss.—It is reported that bonds have been sold for various improvements.

Butte, Neb.—Proposals are asked, until April 7, for constructing a bridge at Parshall's crossing, Niobrara river, between Holt and Boyd counties.—W. P. Simar, County Clerk, Holt County, Neb.

Bryan, Ohio.—Proposals will be received, until March 23, for constructing the Hammet bridge, in Brady Township; also the Garber bridge, the Orton bridge and the Neil bridge. Plans have also been prepared for building the West bridge, in Bridge-water Township, and the Stryker bridge, in Springfield Township.—R. H. Weaver, County Auditor.

Cleveland, Ohio.—Proposals will be received, until April 4, for the construction of a steel bridge in Independence Township.—Julius C. Dorn, Clerk, Board of County Commissioners.—William H. Evers, Engineer.

Columbus, Ohio.—An ordinance is before the City Council for a \$200,000 bond issue to erect a garbage disposal plant.

Sandusky, Ohio.—It is stated that \$150,000 in bonds will be issued to complete the West End channel.

Altoona, Pa.—It is stated that \$300,000 is available for constructing a new impounding dam below the two dams at Kittingan Point.—Harvey Linton, City Engineer.

Altoona, Pa.—The Board of Health, in its annual report, recommends the erection of a garbage crematory.

Meadville, Pa.—Bonds for \$50,000 may shortly be issued for local improvements. Some paving will be undertaken, and sewers will be built. It is also proposed to construct waterworks.

Williamsport, Pa.—Plans have been completed for constructing the new County bridge over Lycoming creek at Third street.

Amarillo, Tex.—The city has voted to build a \$20,000 bridge.

Burnett, Texas.—The citizens have voted to issue bonds for erecting County bridges.

Texarkana, Texas.—It is reported that bids will shortly be asked for building several bridges. Plans are before the City Council.

Virginia Beach, Va.—Engineers are preparing plans for various improvements. Sewers will be constructed, and waterworks built. The estimated cost is \$100,000.

Manitowoc, Wis.—A special election will be held to vote on \$75,000 bond issue for a new bridge at Tenth street.

Cobourg, Ont.—A new Jail and House of Refuge are to be built for the counties of Northumberland and Durham.—Col. McLean, Warden.

Brandon, Man., Canada.—Proposals are asked for furnishing 7,000 barrels of Portland cement, to be delivered April 12.—George F. Sykes, Secretary; W. H. Shillinglaw, City Engineer.

Vancouver, B. C., Canada.—It is reported that \$1,500,000 will be expended during the year for public work.



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Proposals

Sewer Bids

Sealed proposals will be received by the City Clerk for the City of McCook, Nebraska, until 8 o'clock P. M., April 2d, 1906, and opened immediately thereafter, for the construction of 2,700 feet of 12-inch and 3,600 feet of 15-inch and 1,520 feet of 8-inch main sewer, including 18 manholes, in the city of McCook. Plans, profiles and specifications may be seen at the office of the City Clerk, or at C. H. Meekers' office at the Court House.

All proposals must be made out on blanks that will be furnished to the bidder by the City Clerk on application. A certified check for \$500 must accompany each proposal.

The City Council reserves the right to reject any and all bids.

W. A. MIDDLETON, City Clerk.

Cement Sidewalks

The Council of the Village of Lebanon, Ohio, will receive bids for about 30,000 sq. feet cement sidewalks, up to 12 M., April 6, 1906. Specifications on file in the clerk's office of said village. Blanks will be furnished on application.

R. B. CORWIN, Clerk.

Street Paving

COLUMBUS, GA.

Bids will be received by the Street Committee of the City Council until 12 M., April 2, 1906, for constructing about 60,000 sq. yds. of street pavement. Bids wanted on Vitrified Brick, Bitulithic and Macadam. The City of Columbus reserves the right to reject any or all bids. Address all communications and requests for specifications to

W. C. CAMPBELL, Supt. of Public Works.

Incinerating Plant

TAMPA, FLA., March 7, 1906.

Proposals for the construction of an incinerating plant for the disposal of garbage, capacity not less than 100 tons per 24 hours, will be received by the Board of Public Works, Tampa, Florida, on or before April 1, 1906.

W. R. FULLER, President.

Attest: S. L. BIGELOW, Clerk.

Artesian Well

GALESBURG, ILL.

Sealed bids will be received by the City of Galesburg, Illinois, until five (5) o'clock P. M., April 16, A. D. 1906, for drilling an eight (8) inch well, according to plans and specifications on file in the office of the City Engineer. The city reserves the right to reject any or all bids.

L. F. BROWN, City Clerk.

Sewerage Systems

PENSACOLA, FLA.

Sealed proposals for the construction of a system of storm-water drains and sanitary sewers for the City of Pensacola, Florida, will be received by the Board of Bond Trustees, at the City Hall, up to 12 o'clock noon of the 15th day of April, A. D. 1906. Proposals to be addressed to L. Hilton Green, Chairman Board of Bond Trustees, and endorsed, "Proposals for constructing Sewer Systems," and must be accompanied with a certified check for the sum of five thousand dollars (\$5,000.00), drawn upon a National Bank, and made payable to the Board of Bond Trustees.

The work to be done consists of approximately forty-three (43) miles of brick, cast-iron, terracotta and concrete sewers and drains, with their several appurtenances, from 8" to 8' 0" in diameter. Plans may be seen and specifications and blank forms of proposals be obtained either of L. Hilton Green, at Pensacola, or at the office of the Consulting Engineer at Wilmington, Delaware. The right is reserved to reject any or all bids.

L. HILTON GREEN,

Chairman Board Bond Trustees.

T. CHALKLEY HATTON, Consulting Engineer.

Proposals for System of Sewers

Sealed bids will be received up to 4 o'clock P. M., April 11, 1906, at the city hall, Georgetown, Ky., for constructing four (4) miles, more or less, of pipe sewers and appurtenances.

Plans may be examined at the city hall, Georgetown, Ky., or at the office of the engineers.

R. H. ANDERSON, Mayor.

D. A. ADAMS, Clerk.

John W. Alvord, Chas. B. Burdick, engineers, 1207 Hartford Building, Chicago, Ill.

Notice to Paving Contractors

Sealed proposals addressed to the City Engineer of El Paso, Texas, will be received until 5 o'clock P. M., Wednesday, March 28, 1906, for furnishing material and labor for paving all streets and parts of streets embraced in "Improvement District No. 1," in El Paso, Texas. Bids will be received on sheet asphalt, rock asphalt, vitrified brick, bitulithic, or a combination of these materials. The surface to be covered is approximately 90,000 square yards, and the material to be used will be selected by the city after the bids are opened.

City Engineer of El Paso, Texas.

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Barr Clay Co., Streator, Ill.
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Clearfield Clay Working Co., Clearfield, Pa.
Collinwood Shale Brick Co., Rose Bldg., Cleveland, Ohio.
Flint Brick & Coal Co., Des Moines, Ia.
McAvoy Vitrified Brick Co., Philadelphia, Pa.
Metropolitan Paving Brick Co., Canton, O.
New England Steam Brick Co., Providence, R. I.
Pittsburg-Buffalo Co., Frick Bldg., Pittsburg, Pa.
Purinton Paving Brick Co., Galesburg, Ill.
Suburban Brick Co., Wheeling, W. Va.
Texas & Pacific Coal Co., Fort Worth, Texas.
Wassall Clay Co., Gloucester, Ohio.
Western Brick Co., Danville, Ill.

Road Machinery, Rock Crushers, Etc.

Acme Road Machinery Co., Frankfort, N. Y.
Austin Mfg. Co., Chicago.
Buffalo Steam Roller Co., Buffalo, N. Y.
Climax Road Machine Co., Marathon, N. Y.
Erie Machine Shops, Erie, Pa. Asphalt Rollers.
Kelly-Springfield Road Roller Co., Springfield, O.

Roofing and Roofing Material.

A. L. Barber Asphalt Co., 17 Battery Place, N. Y.
California Asphaltum Sales Agency, Mills Building, San Francisco, Cal.
Robt. A. Keasbey Co., 100 N. Moore St., N. Y.
Warren Bros. Co., Boston, Mass.
Warren Co., E. B., Washington, D. C.

Paving Materials (See also Brick).

A. L. Barber Asphalt Co., 17 Battery Place, N. Y.
Bevier Improved Wood Pavement Co., St. Paul Bldg., New York.
California Asphaltum Sales Agency, Mills Bldg., San Francisco, Cal.
Central Bitulithic Paving Co., Detroit, Mich.
Chatfield & Woods Co., Cincinnati, O.
Globe Asphalt Co., 405 Bakewell Bldg., Pittsburg, Pa.
Southern Bitulithic Co., Nashville, Tenn.
Standard Bitulithic Co., 253 Broadway, N. Y.
U. S. Wood Preserving Co., 29 Broadway, N. Y.
Wadsworth Stone & Paving Co., Pittsburg, Pa.
Warren Brothers Co., Boston, Mass.
Warren Asphalt Paving Co., Cambridge, Mass.

Sewer Pipe.

Buckeye Fire Clay Co., Uhriessville, O.
East Ohio Sewer Pipe Co., Irondale, O.
Federal Clay Products Co., Pittsburg, Pa.
Great Northern Sewer Pipe Co., Empire, O.
Ohio River Sewer Pipe Co., Empire, O.
Pittsburg-Buffalo Co., Pittsburg, Pa.
Stratton Fire Clay Co., Empire, O.

Street Cleaning and Sprinkling Equipment.

Austin-Western Co., Chicago, Ill.
Etnyre, E. D., & Co., Oregon, Ill.
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Studebaker Bros. Mfg. Co., South Bend, Ind.

Wagons and Carts.

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Austin Mfg. Co., Chicago, Ill.
Climax Road Machine Co., Marathon, N. Y.
Fulton & Walker Co., Philadelphia, Pa.
Hawwood Wagon Co., Baldwinsville, N. Y.
Hill Cart & Wagon Works, Jersey City, N. J.

Studebaker Bros. Mfg. Co., South Bend, Ind.
Tiffin Wagon Co., Tiffin, Ohio.
Troy Wagon Works Co., Troy, O.
Watson Wagon Co., Centre & Buck Sts., Canastota, N. Y.

Water-Works Equipment and Supplies.

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Well Drilling.
Bethlehem Fdy. & Mach. Co., South Bethlehem, Pa. Pumping Machinery.
Buffalo Meter Co., Buffalo, N. Y. Meters.
Central Foundry Co., 116 N. Nassau St., N. Y. Pipe.
Hersey Mfg. Co., So. Boston, Mass. Meters.
Ellis-Ford Pipe Cutter Co., Detroit, Mich., Pipe Cutters.
Mueller Mfg. Co., H., Decatur, Ill. Supplies.
Neptune Meter Co., New York. Meters.
Pittsburg Filter Mfg. Co., Pittsburg, Pa. Filtration Plants for Water-Works.
Pittsburg Meter Co., E. Pittsburg, Pa. Meters.
Rife Pumping Engine Co., 111 Broadway, N. Y.
John Simmons Co., N. Y. Supplies.
Thomson Meter Co., Brooklyn, N. Y. Meters.
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Washington Pipe & Foundry Co., Tacoma, Wash. Pipe, Hydrants, Valves.

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American-La France Fire Engine Co., Elmira, N. Y. Fire Engines and all Fire Department Equipment.
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Fabric Fire Hose Co., Duane & Church Sts., N. Y. Hose.
Firestone Tire & Rubber Co., Akron, O. Rubber Tires.
Gamewell Fire Alarm Telegraph Co., N. Y. Fire and Police Alarm Systems.
Glazier Nozzle & Manufacturing Co., Indianapolis, Ind. Nozzles.
Seagrave Co., Columbus, O. Apparatus and Supplies.
Star Electric Co., Binghamton, N. Y. Fire Alarm Systems.

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Carson Trench Machine Co., Boston. Trench Machinery.
Cleveland Street Lighting Co., Cleveland, Ohio. Street Lamps.
Climax Supply Co., 712 Marquette Building, Chicago. Sign Posts.
Contractors Supply & Equipment Co., Chicago. Concrete Mixers, Contractors' Supplies.
Davison Foundry Co., 103-109 W. Monroe St., Chicago. Catch Basins.
Hetherington & Berner, Indianapolis. Asphalt Plants.
John Maslin & Sons, Jersey City, N. J. Contractors' Pumps.
Okonite Co., Ltd., New York. Wire.
Pacific Flush Tank Co., Chicago. Flush Tanks.
Shields, W. S., 1715 Marquette Bldg., Chicago. Valves for Sewage Disposal Works.
Soltmann, E. G., 125 E. 42d St., N. Y. Drawing Materials.
Southern Exchange Co., New York. Poles for Street Lighting.
Universal Safety Tread Co., 45 Broadway, New York. Safety Treads.
Warner Co., Chas., Wilmington, Del. Cement.

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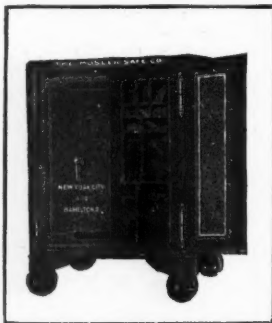
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